



Climate change and dengue: A critical and systematic review of quantitative modelling approaches

Author(s): Naish S, Dale P, Mackenzie JS, McBride J, Mengersen K, Tong S
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Abstract:

Background: Many studies have found associations between climatic conditions and dengue transmission. However, there is a debate about the future impacts of climate change on dengue transmission. This paper reviewed epidemiological evidence on the relationship between climate and dengue with a focus on quantitative methods for assessing the potential impacts of climate change on global dengue transmission. **Methods:** A literature search was conducted in October 2012, using the electronic databases PubMed, Scopus, ScienceDirect, ProQuest, and Web of Science. The search focused on peer-reviewed journal articles published in English from January 1991 through October 2012. **Results:** Sixteen studies met the inclusion criteria and most studies showed that the transmission of dengue is highly sensitive to climatic conditions, especially temperature, rainfall and relative humidity. Studies on the potential impacts of climate change on dengue indicate increased climatic suitability for transmission and an expansion of the geographic regions at risk during this century. A variety of quantitative modelling approaches were used in the studies. Several key methodological issues and current knowledge gaps were identified through this review. **Conclusions:** It is important to assemble spatio-temporal patterns of dengue transmission compatible with long-term data on climate and other socio-ecological changes and this would advance projections of dengue risks associated with climate change.

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Resource Description

Communication: ☒

resource focus on research or methods on how to communicate or frame issues on climate change; surveys of attitudes, knowledge, beliefs about climate change

A focus of content

Communication Audience: ☒

audience to whom the resource is directed

Researcher

Exposure : ☒

weather or climate related pathway by which climate change affects health

Climate Change and Human Health Literature Portal

Ecosystem Changes, Meteorological Factors, Precipitation, Solar Radiation, Temperature

Temperature: Fluctuations

Geographic Feature: ☒

resource focuses on specific type of geography

General Geographical Feature

Geographic Location: ☒

resource focuses on specific location

Global or Unspecified

Health Impact: ☒

specification of health effect or disease related to climate change exposure

Infectious Disease, Morbidity/Mortality

Infectious Disease: Vectorborne Disease

Vectorborne Disease: Mosquito-borne Disease

Mosquito-borne Disease: Dengue

Model/Methodology: ☒

type of model used or methodology development is a focus of resource

Methodology

Population of Concern: A focus of content

Population of Concern: ☒

populations at particular risk or vulnerability to climate change impacts

Children

Resource Type: ☒

format or standard characteristic of resource

Review

Timescale: ☒

time period studied

Time Scale Unspecified